



**Parker Ridge  
Traffic Impact Analysis**

Rolesville, North Carolina

August 15, 2022

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# Sign-off Sheet

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**8/15/2022**

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## Executive Summary

The proposed Parker Ridge Development is located on both sides of Redford Place Drive south of US 401 Business (South Main Street) in Rolesville, NC. The proposed development will consist of 162 single-family homes and 114 townhomes. The development is anticipated to be completed in 2028.

The development is expected to generate 2,391 new trips per average weekday. In the AM and PM peak hours, the development is expected to generate 170 AM peak hour trips (47 entering and 123 exiting) and 220 PM peak hour trips (134 entering and 86 exiting).

Access to the site is envisioned to be provided by adding an eastbound and westbound approach to the existing roundabout on Redford Place Drive, located approximately 1,100 feet south of the school driveway. Additional access will be located on School Street just south of the Rolesville Elementary School and future Scarboro development driveways.

The purpose of this report is to evaluate the proposed development in terms of traffic conditions, evaluate the ability of the adjacent roadways to accommodate the additional traffic volumes, and recommend transportation improvements needed to mitigate congestion that may result from the additional site traffic. This report presents trip generation, trip distribution, traffic analysis, and recommendations for transportation improvements needed to meet anticipated traffic demands. This report examines the following scenarios for the AM and PM peak hours:

- 2022 Existing;
- 2028 No-Build;
- 2028 Build; and
- 2028 Build with Improvements.

Capacity analysis for the AM and PM peak hours in each scenario were performed for the following intersections:

- Old Rogers Road / School Street at South Main Street (US 401 Business);
- Redford Place Drive / Rogers Road at South Main Street (US 401 Business);
- School Street at School Driveway / Scarboro Driveway;
- Redford Place Drive at School Driveway; and
- Redford Place Drive at Access A / Access B.

Table ES-1 shows a summary of the capacity analysis results included in this Traffic Impact Analysis (TIA).



**Table ES-1: Level of Service Summary Table**

Level of Service (Delay, sec/veh)	2022 Existing		2028 No-Build		2028 Build	
	AM	PM	AM	PM	AM	PM
Old Rogers Road / School Street at South Main Street (US 401 Business)	C (22.5)	D (28.7)	F (70.7)	E (47.7)	F (63.5)	F (580.5)
Redford Place Drive / Rogers Road at South Main Street (US 401 Business)	D (35.2)	D (36.2)	D (51.8)	E (58.5)	D (55.0)	E (62.7)
School Street at School Driveway / Scarboro Driveway	-	-	A (8.9)	A (8.6)	A (9.0)	A (8.8)
Redford Place Drive at School Driveway	B (10.5)	A (9.7)	B (11.2)	B (10.3)	B (12.8)	B (11.1)
Redford Place Drive at Access A / Access B	-	-	-	-	A (4.1)	A (4.4)

With the addition of traffic generated by the proposed development, the northbound School Street approach of the South Main Street at Old Rogers Road / School Street intersection increases in delay such that LOS degrades from E to F. It is not uncommon for unsignalized side-street approaches to operate with high delays during peak periods. As traffic on Main Street does not stop, the overall delay at the intersection is relatively low at 2.3 seconds per vehicle in the AM peak hour and 18.9 seconds in the PM peak hour. If high delays are experienced on the stop-controlled approaches, drivers may opt for alternative routes. Even so, the intersection was evaluated for potential improvements due to meet the requirements of the LDO:

- The installation of a traffic signal would improve the LOS of the side streets significantly. This, however, is not anticipated to be permitted by NCDOT due to the proximity of the intersection to the adjacent signalized intersection of South Main Street at Redford Place Drive/Rogers Road, as well as the low traffic volumes on the side-street approaches of Old Rogers Road and School Street which are not anticipated to meet the warrants for installation of a traffic signal included in the Manual on Uniform Traffic Control Devices (MUTCD).
- The construction of dedicated left-turn turn-lanes on Old Rogers Road and School Street reduces delay but does not mitigate the impact of the proposed development. This is attributed to low volumes of traffic on the side-street approaches and high through volumes on South Main Street. The installation of turn lanes may also impact adjacent property owners. As a result, the installation of turn lanes on Old Rogers Road and School Street is not recommended.
- Converting the southbound approach of Old Rogers Road to right-in / right-out access by installing channelization was shown to reduce delays on the side streets such that School Street is anticipated to operate at LOS C and Old Rogers Road is anticipated to operate at LOS B during the PM peak hour. This would require left turns from Old Rogers Road to be redirected to Rogers Road and use the traffic signal at the intersection of South Main Street at Redford Place Drive / Rogers Road; increasing travel time for existing vehicles on the Old Rogers Road approach. Furthermore, the restriction of access without the



## PARKER RIDGE TRAFFIC IMPACT ANALYSIS

installation of a median has only limited effectiveness. As a result, the restriction of access is not recommended.

Therefore, no improvements are recommended at the South Main Street at Old Rogers Road / School Street intersection in conjunction with this development. Consideration should be made for limiting the southbound Old Rogers Road approach to right-in / right-out-only access in the future.

The signalized intersection of South Main Street at Redford Place Drive / Rogers Road operates at LOS E during the PM peak hour in both the no-build and build scenarios. In this instance, the LDO requires mitigation if the proposed development causes the LOS to fall to the next lower letter grade. As the intersection operates at LOS E during both the no-build and build scenarios, no improvements are recommended at this intersection.

The following improvements are recommended to be constructed as part of the Parker Ridge Development:

### Old Rogers Road / School Street at South Main Street

- No improvements are recommended at this intersection.

### Redford Place Drive / Rogers Road at South Main Street

- No improvements are recommended at this intersection

### School Street at School Driveway / Scarborough Driveway

- No improvements are recommended at this intersection

### Redford Place Drive at School Driveway

- No improvements are recommended at this intersection

### Redford Place Drive at Access A / Access B

- Construct Access A and Access B at the existing roundabout along Redford Place Drive south of the School Driveway intersection. Both intersections should have a minimum internal protective stem of 100 feet.

These recommendations are illustrated in Figure ES-1.



Figure ES-1: Recommended Improvements

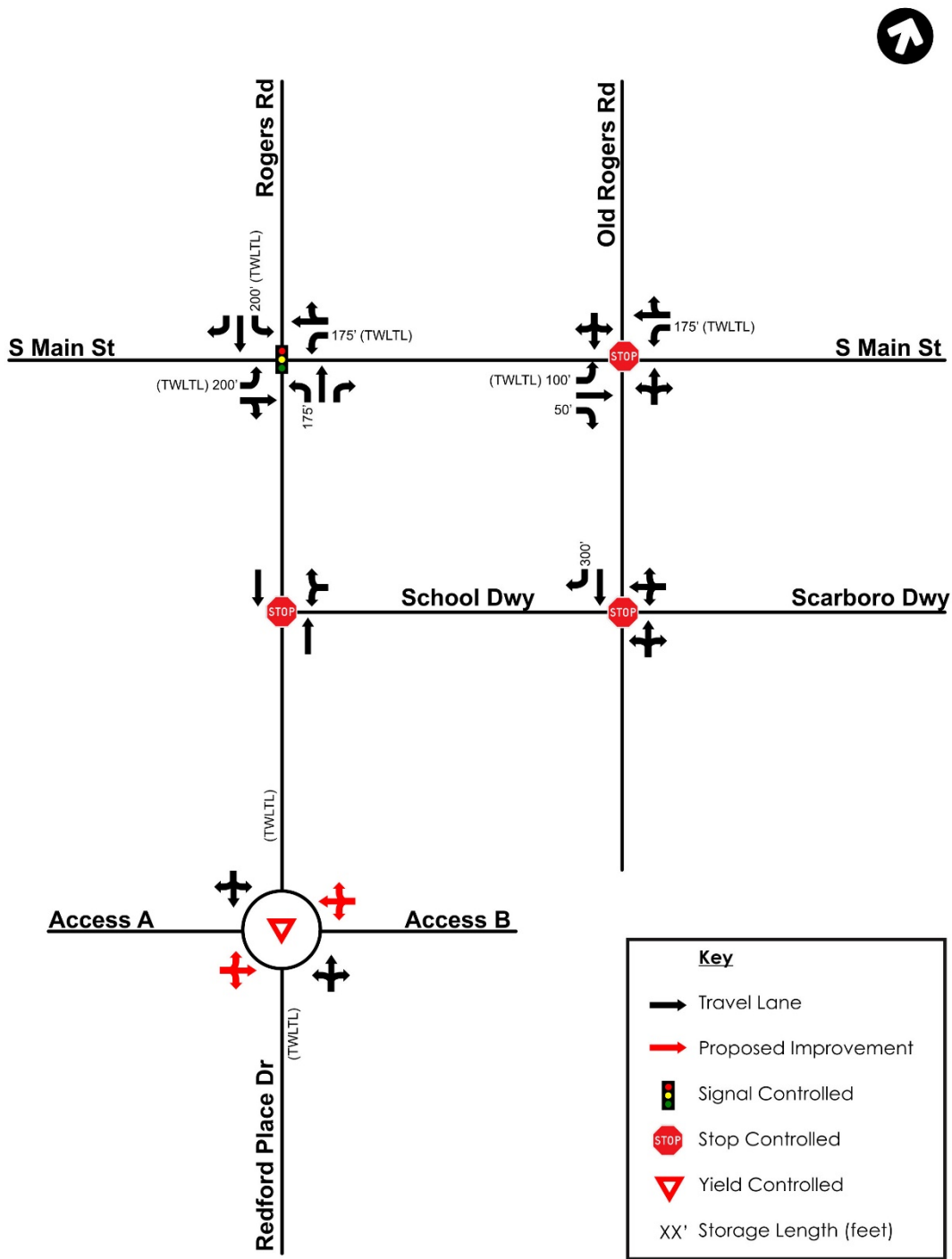


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# PARKER RIDGE TRAFFIC IMPACT ANALYSIS

Introduction  
August 15, 2022

## 1.0 INTRODUCTION

The purpose of this report is to evaluate the transportation impacts of the proposed Parker Ridge development located on the east and west sides of Redford Place Drive, south of Main Street in Rolesville, NC. The project location is shown below in Figure 1.

This report evaluates the feasibility of the adjacent transportation system to accommodate the total Build traffic demands of the proposed development for the Build year of 2028. The proposed development will consist of 162 single-family homes and 114 townhouses.

Trip generation, trip distribution, and traffic analysis for the following AM and PM peak hour scenarios are included in this study:

- 2022 Existing;
- 2028 No-Build;
- 2028 Build; and
- 2028 Build Improved.

Figure 2 shows the conceptual site plan prepared by BGE. An electronic copy of the site plan is provided in the appendix.



# PARKER RIDGE TRAFFIC IMPACT ANALYSIS

Introduction  
August 15, 2022

### Figure 1: Site Location

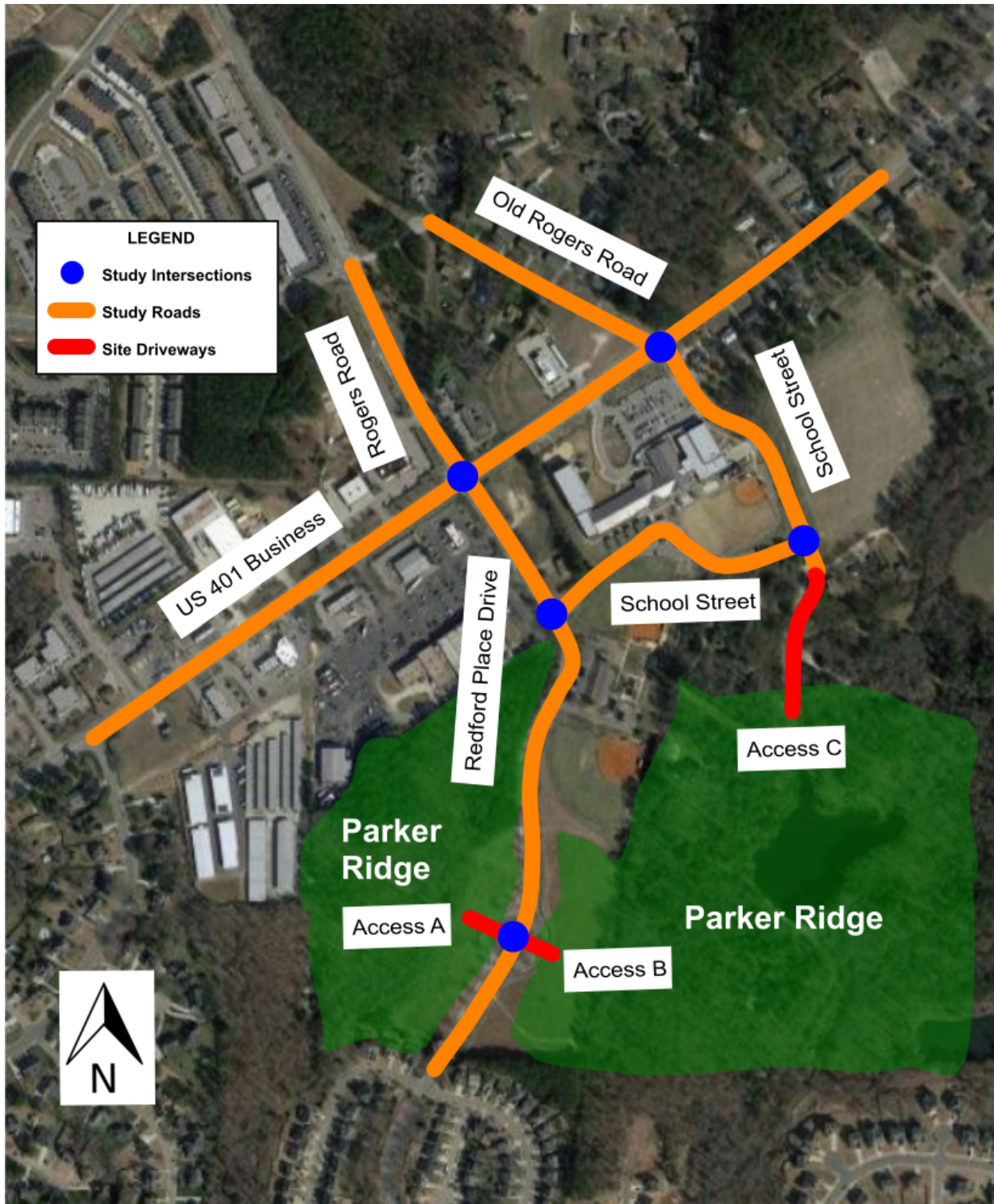
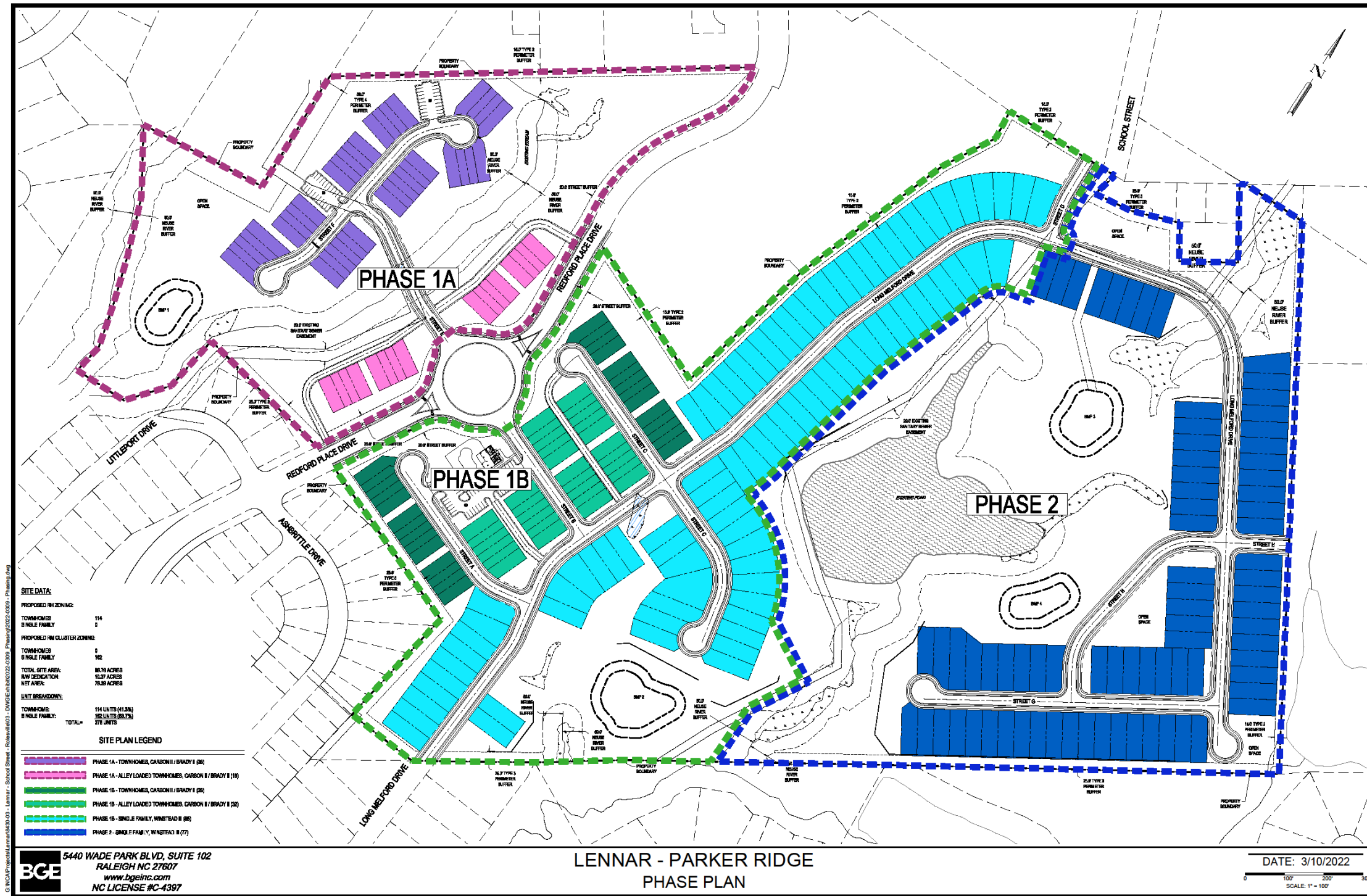


Figure 2: Site Plan



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## **PARKER RIDGE TRAFFIC IMPACT ANALYSIS**

Inventory of Traffic Conditions  
August 15, 2022

## **2.0 INVENTORY OF TRAFFIC CONDITIONS**

### **2.1 STUDY AREA**

Stantec coordinated with the Town of Rolesville to determine the appropriate study area and assumptions. The following intersections were agreed upon to be analyzed to determine the impacts associated with this development.

- Old Rogers Road / School Street at South Main Street (US 401 Business);
- Redford Place Drive / Rogers Road at South Main Street (US 401 Business);
- School Street at School Driveway / Scarboro Driveway;
- Redford Place Drive at School Driveway; and
- Redford Place Drive at Access A / Access B.

### **2.2 PROPOSED ACCESS**

Access to the site is envisioned to be provided by adding eastbound and westbound approaches to the existing roundabout on Redford Place Drive, located approximately 1,100 feet south of the school driveway. Additional access will be located on School Street just south of the Rolesville Elementary School and future Scarboro development driveways.

### **2.3 EXISTING CONDITIONS**

Table 1 provides a detailed description of the existing study area roadway network. All functional classification and average annual daily traffic (AADT) information were obtained from the North Carolina Department of Transportation (NCDOT).





## PARKER RIDGE TRAFFIC IMPACT ANALYSIS

Inventory of Traffic Conditions  
August 15, 2022

**Table 1: Existing Conditions**

Road Name	Road Number	Primary Cross-Section	Functional Classification <sup>1</sup>	2020 AADT <sup>2</sup> (vpd)	Speed Limit (mph)	Maintenance Agency
Main Street	US 401 Business	Two-Lane W/ TWLTL*	Principal Arterial	9,400 (east of Rogers) 12,000 (west of Rogers)	35	NCDOT
Old Rogers Road	-	Two-Lane Undivided	Local Road	-	35	Town of Rolesville
Redford Place Drive	-	Two-Lane Undivided	Local Road	-	25	Town of Rolesville
Rogers Road	SR 2052	Four-Lane w/TWLTL	Major Collector	7,600	35	NCDOT
School Driveway	-	Two-Lane One-Way	Private Driveway	-	-	WCPSS
School Street	-	Two-Lane Undivided	Local Road	-	35	WCPSS

\*TWLTL = Continuous Two-Way Left-Turn Lane

The existing lane configuration and traffic control for the study area intersections are illustrated in Figure 3.

## 2.4 FUTURE CONDITIONS

The NCDOT U-6241 project proposes to realign Burlington Mills Road and construct a new intersection with South Main Street (US 401 Business). U-6241 is also expected to provide improvements to the pedestrian and bike facilities along Main Street and add a concrete median along Main Street west of Rogers Road. As part of the project, geometric improvements will be made to Main Street in the study area, notably, removing the dedicated westbound right turn lane at the Main Street & Rogers Road/Redford Place Drive intersection and re-striping the existing westbound through lane to a shared thru-right turn lane. The construction year of this project is 2022.

In addition, the Scarboro development will construct a new driveway along School Street, at the existing School Street & School Driveway intersection. The Scarboro development is discussed in more detail in Section 4.3

The future year lane configuration and traffic control for the study area intersections are illustrated in Figure 5.



PARKER RIDGE TRAFFIC IMPACT ANALYSIS

Inventory of Traffic Conditions  
August 15, 2022

Figure 3: 2022 Existing Lanes and Traffic Control

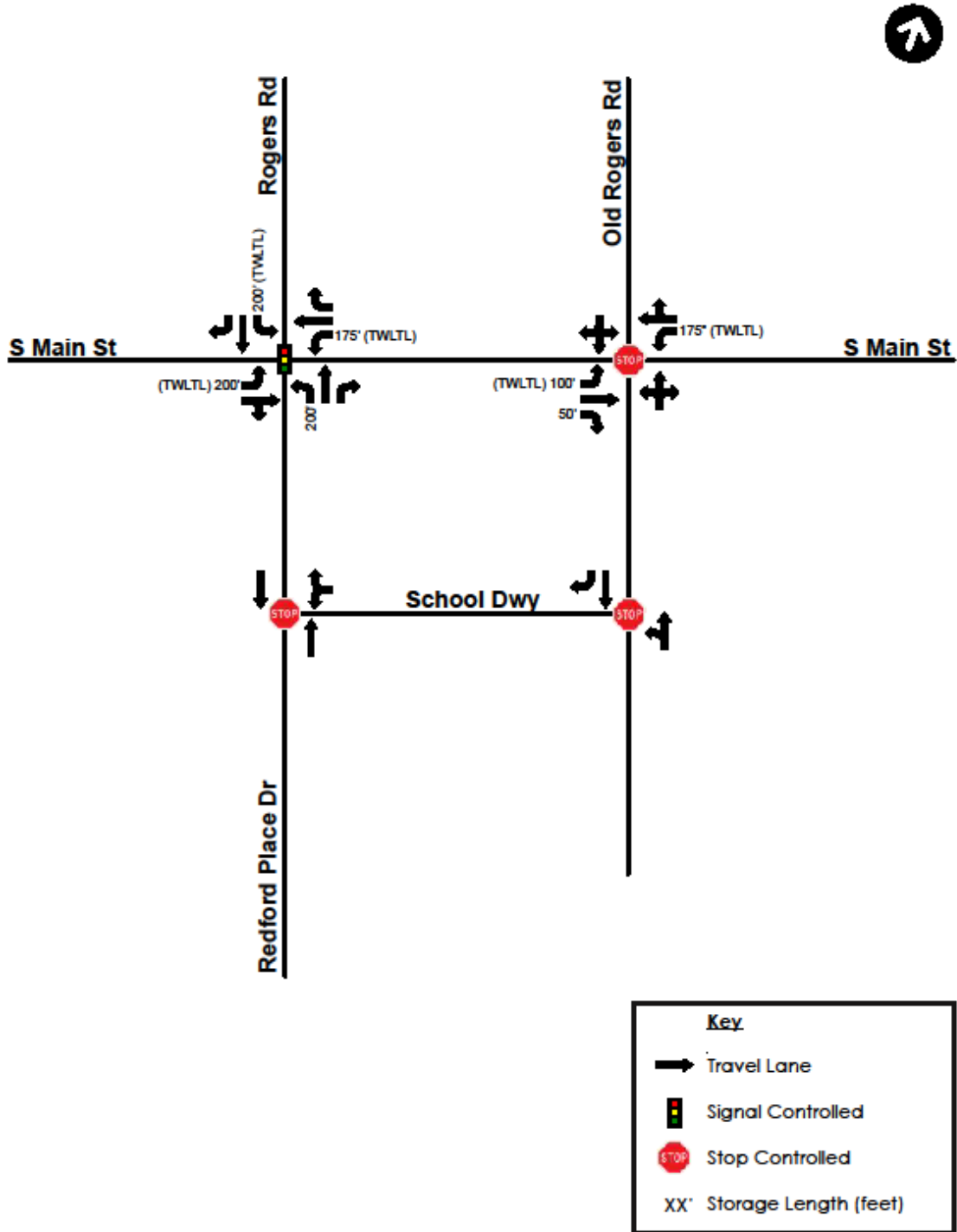


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**PARKER RIDGE TRAFFIC IMPACT ANALYSIS**

Inventory of Traffic Conditions  
August 15, 2022

**Figure 4: 2028 No-Build Lanes and Traffic Control**

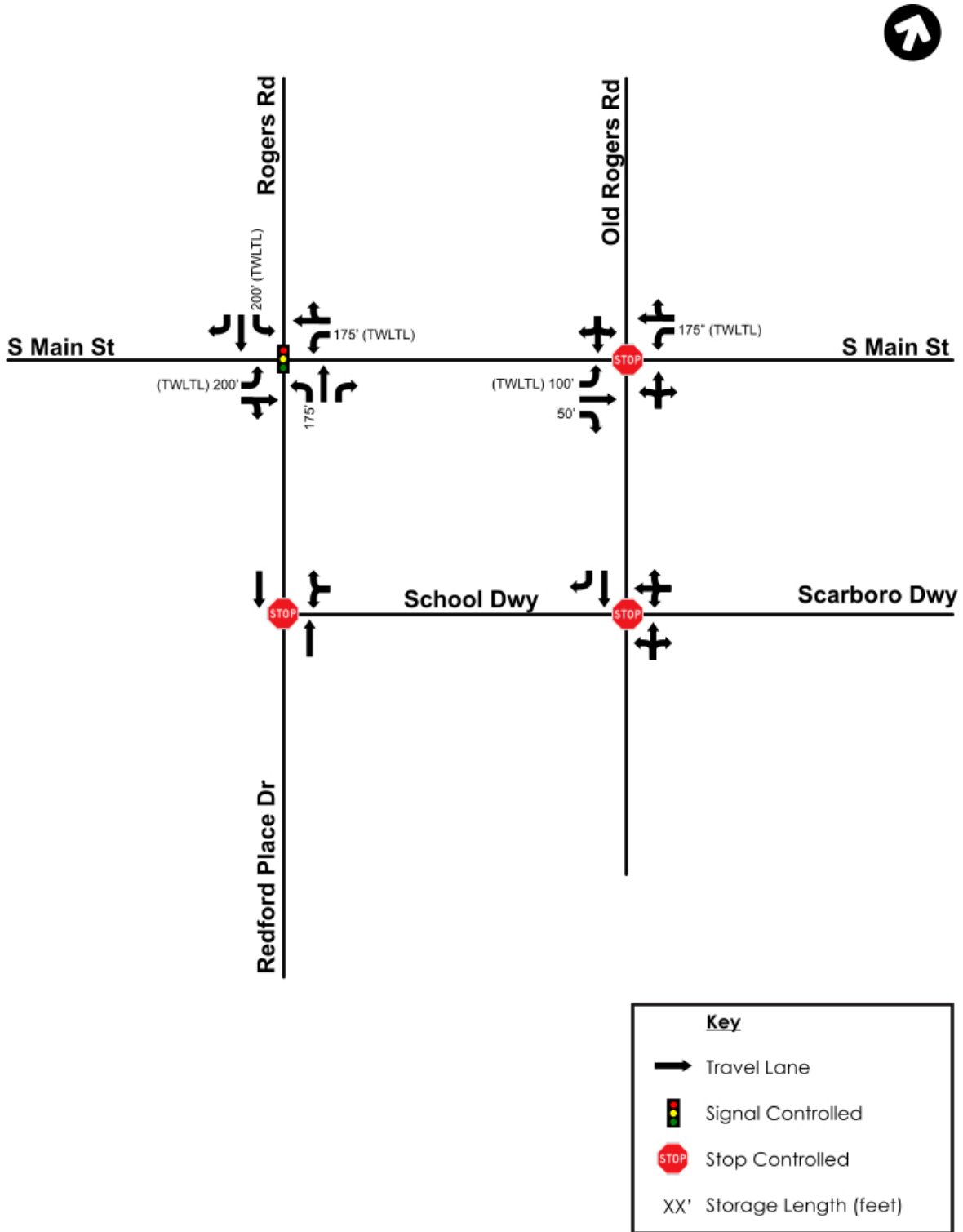


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### 3.0 TRIP GENERATION AND DISTRIBUTION

#### 3.1 TRIP GENERATION

Table 2 below shows the number of anticipated trips that will be generated by the proposed development. These values are calculated using the 11<sup>th</sup> Edition of the Institute of Transportation Engineers Trip Generation Manual<sup>3</sup>. No internal capture or pass-by reductions are expected with these land uses.

**Table 2: Trip Generation**

Land Use	Size	Daily			AM Peak			PM Peak		
		Total	Enter	Exit	Total	Enter	Exit	Total	Enter	Exit
Single-Family Detached Housing (LUC 210)	162 Units	1573	786	787	116	30	86	156	98	58
Single-Family Attached Housing (LUC 215)	114 Units	818	409	409	54	17	37	64	36	28
Total Trips Generated		2391	1195	1196	170	47	123	220	134	86

#### 3.2 SITE TRIP DISTRIBUTION

To accurately determine the effect of the proposed development on the surrounding roadway network, an estimate of the expected distribution of traffic entering and exiting the site is needed. The following percentages were used in both the AM and PM peak hours:

- 50% to/from the west on Main Street;
- 25% to/from the east on Main Street; and
- 25% to/from the north on Rogers Road.

These percentages were developed using a combination of existing traffic volume counts, historic average annual daily traffic (AADT) recordings provided by NCDOT, and engineering judgment. Figure 5 shows the distribution described above as well as the turning movement percentages at each intersection. Figure 6 shows the actual trips that are expected to be generated through the study area intersections.





**PARKER RIDGE TRAFFIC IMPACT ANALYSIS**

Trip Generation and Distribution  
August 15, 2022

**Figure 5: Site Trip Distribution**

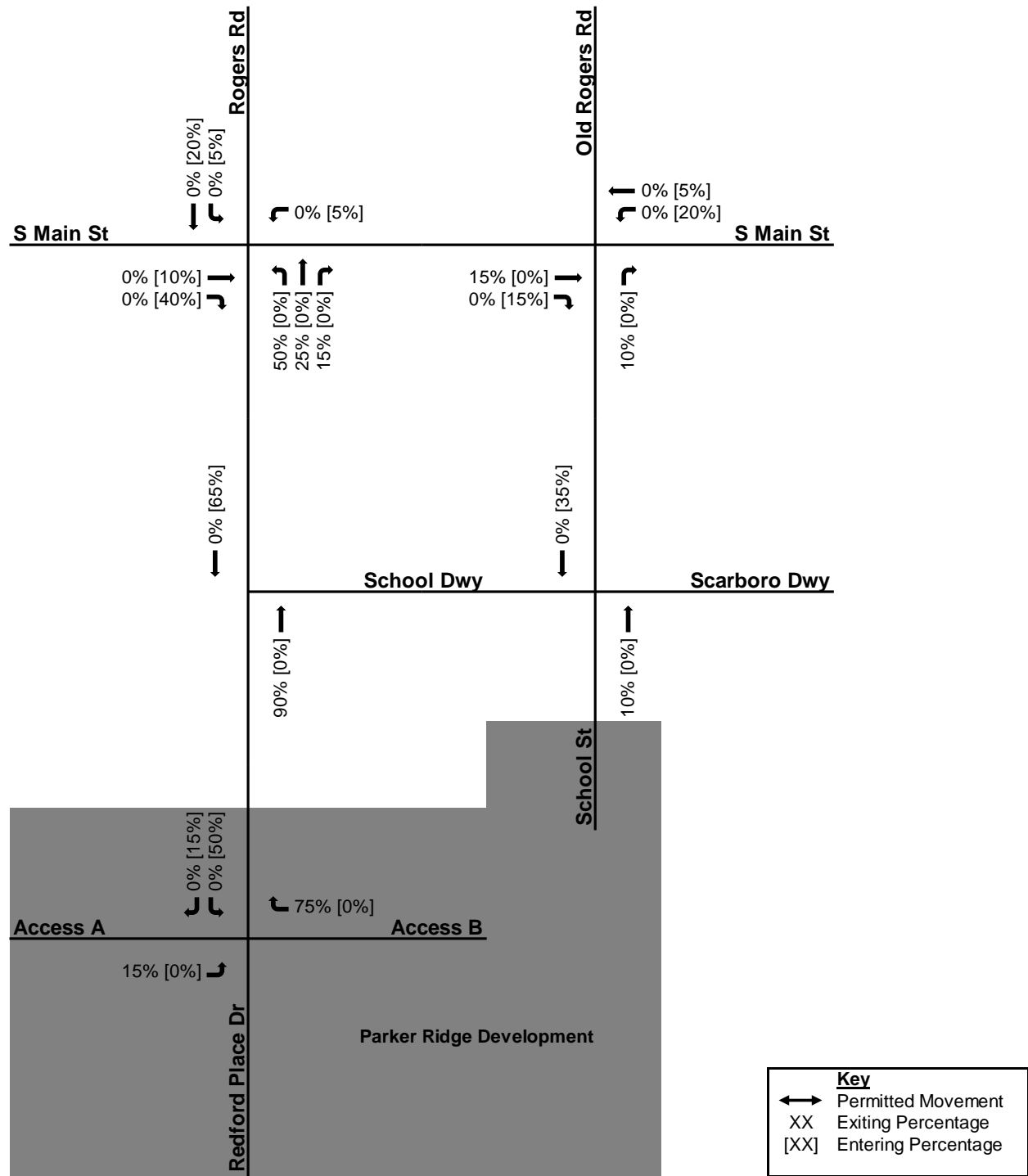


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**PARKER RIDGE TRAFFIC IMPACT ANALYSIS**

Trip Generation and Distribution  
 August 15, 2022

**Figure 6: Site Trip Assignment**

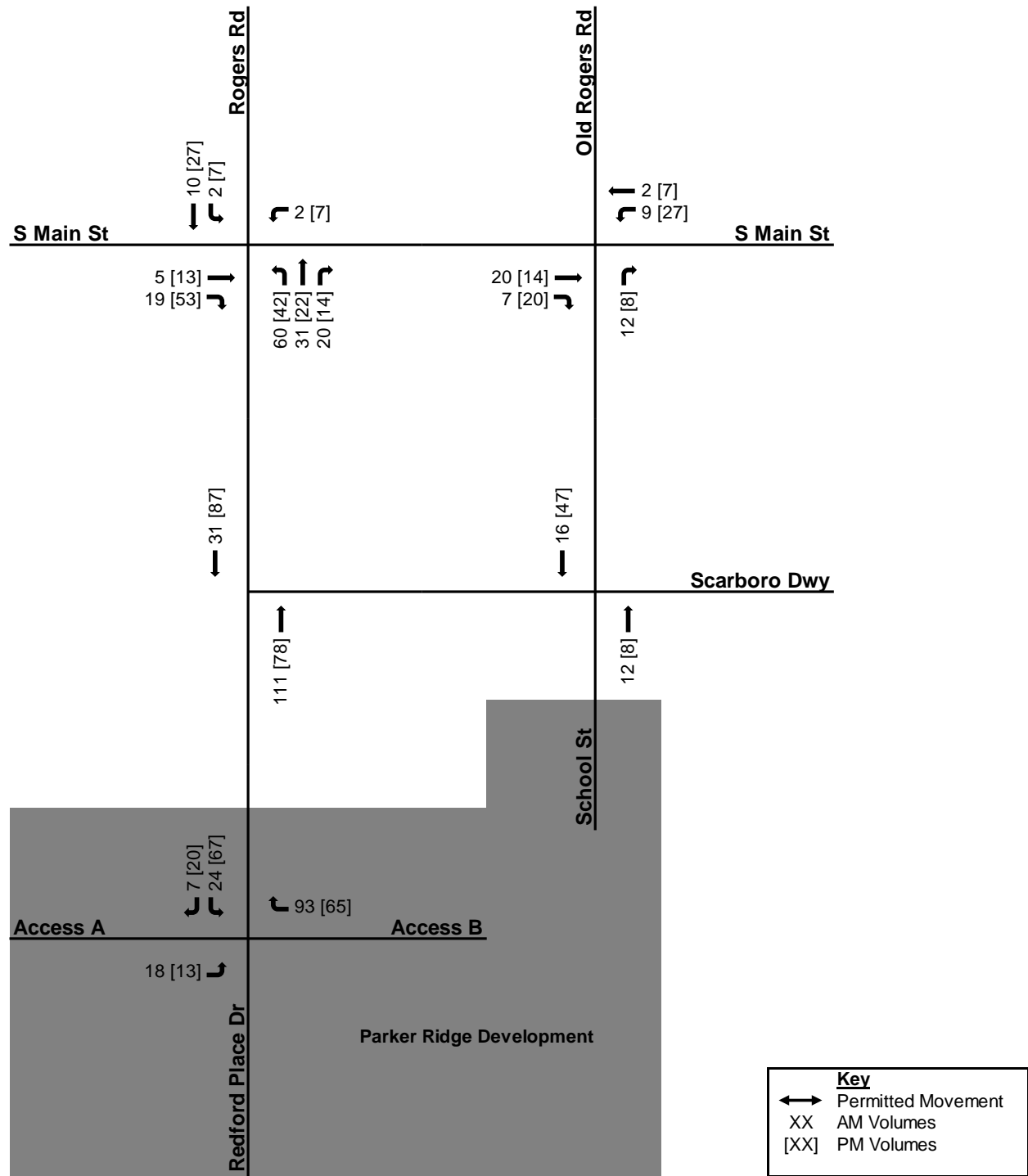


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## PARKER RIDGE TRAFFIC IMPACT ANALYSIS

Traffic Volumes  
August 15, 2022

### 4.0 TRAFFIC VOLUMES

#### 4.1 DATA COLLECTION

AM (7:00 – 9:45 AM) and PM (4:00 – 6:00 PM) turning movement counts were collected on Thursday, June 9, 2022, at the following intersections:

- Old Rogers Road / School Street at South Main Street (US 401 Business);
- Redford Place Drive / Rogers Road at South Main Street (US 401 Business);
- School Street at School Driveway / Scarboro Driveway; and
- Redford Place Drive at School Driveway.

Raw count data for these locations are included in the appendix.

Traffic volumes were not balanced due to the high-volume driveways between study intersections. Notably, the school entrance located on Main Street as well as the shopping center driveway along Redford Place Drive. The Existing (2022) traffic volumes are shown in Figure 7.

#### 4.2 NO-BUILD TRAFFIC VOLUMES

The count data was grown by two percent (2%) per year to estimate traffic growth from 2022 to 2028. The historical growth traffic volumes were added to the existing volumes to determine the 2028 No-Build traffic volumes. Three approved developments in the vicinity of the study area were accounted for in this traffic analysis as discussed in the following sections. The 2028 No-Build traffic volumes are shown in Figure 11.

##### 4.2.1 Cobblestone

Cobblestone is a mixed-use development proposed in the northwest quadrant of the intersection of Main Street & Young Street. The proposed development is expected to consist of 180 apartments, 18,200 square feet of municipal flex space, and 50,000 square feet of retail space. It is estimated to be built by 2023. The trips attributed to the Cobblestone approved development are shown in Figure 8. A copy of the *Traffic Impact Analysis for Cobblestone Crossing Mixed-Use* (Ramey Kemp & Associates, March 2021) is provided in the appendix.

##### 4.2.2 Redford Place

Redford Place is a proposed 3-story, 19,500 square foot, mixed-use building with the top two stories being a medical/dental office and the ground-floor consisting of retail uses. The development is located on the east side of Redford Place Drive south of Main Street. The trips attributed to the Redford Place development are shown in Figure 9. A copy of the *Redford Place Traffic Impact Analysis* (Stantec, October 2019) is provided in the appendix.

As part of the Redford Place development, the storage of the northbound left-turn lane at the Main Street & Rogers Road development will be reduced from 200 feet to 175 feet of full-width storage, to accommodate the installation of a southbound left-turn lane on Redford Place Drive at the Site Driveway.



## PARKER RIDGE TRAFFIC IMPACT ANALYSIS

Traffic Volumes  
August 15, 2022

### 4.2.3 Scarborough Property

Scarboro Property is a proposed development expected to consist of 240 units of senior adult housing. The trips attributed to the Scarboro Property development are shown in Figure 10. A copy of the *Site Analysis – Scarboro Property* (Ramey Kemp Associates, May 2021) is provided in the appendix. A new site driveway will be built on School Street at the existing School Street & School Driveway intersection.

## 4.3 BUILD TRAFFIC VOLUMES

The 2028 Build traffic volumes include the 2028 No-Build traffic, approved development traffic, and the proposed development traffic discussed in section 3.0. The 2028 Build traffic volumes are shown in Figure 12.



PARKER RIDGE TRAFFIC IMPACT ANALYSIS

Traffic Volumes  
August 15, 2022

Figure 7: 2022 Existing Traffic Volumes

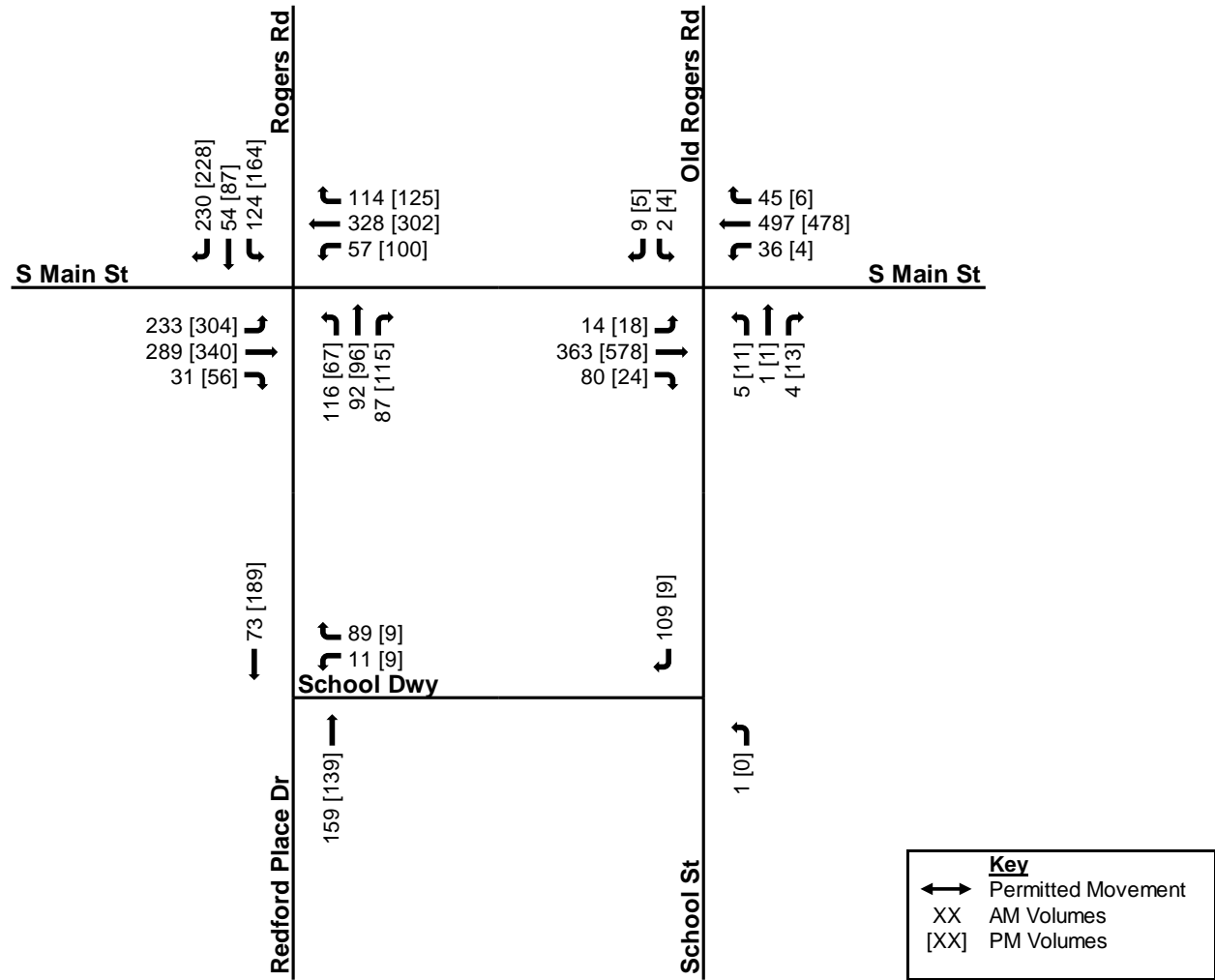


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PARKER RIDGE TRAFFIC IMPACT ANALYSIS

Traffic Volumes  
August 15, 2022

Figure 8: Cobblestone Approved Development Volumes

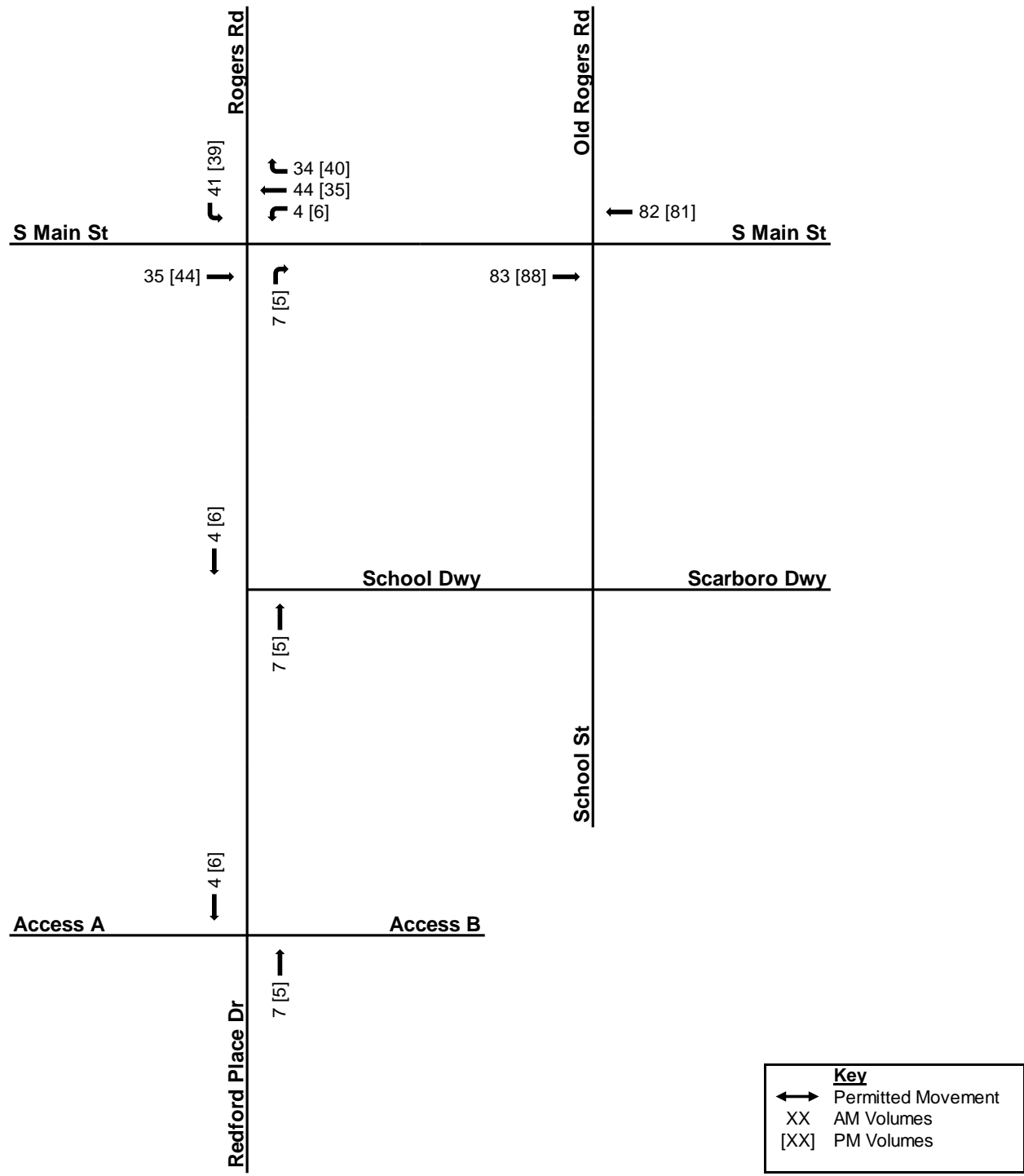


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PARKER RIDGE TRAFFIC IMPACT ANALYSIS

Traffic Volumes  
August 15, 2022

Figure 9: Redford Approved Development Volumes

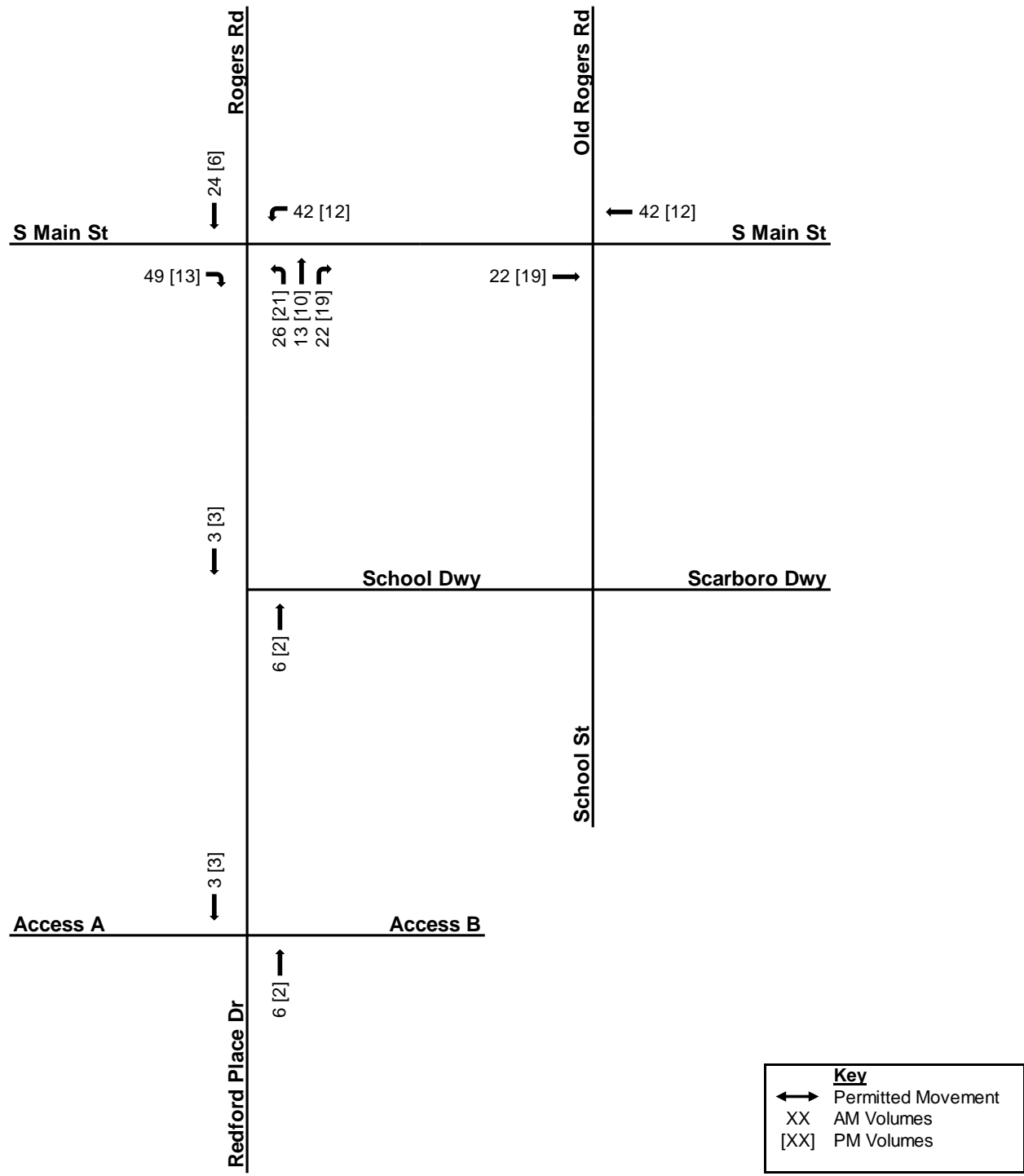


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PARKER RIDGE TRAFFIC IMPACT ANALYSIS

Traffic Volumes  
August 15, 2022

Figure 10: Scarborough Approved Development Volumes

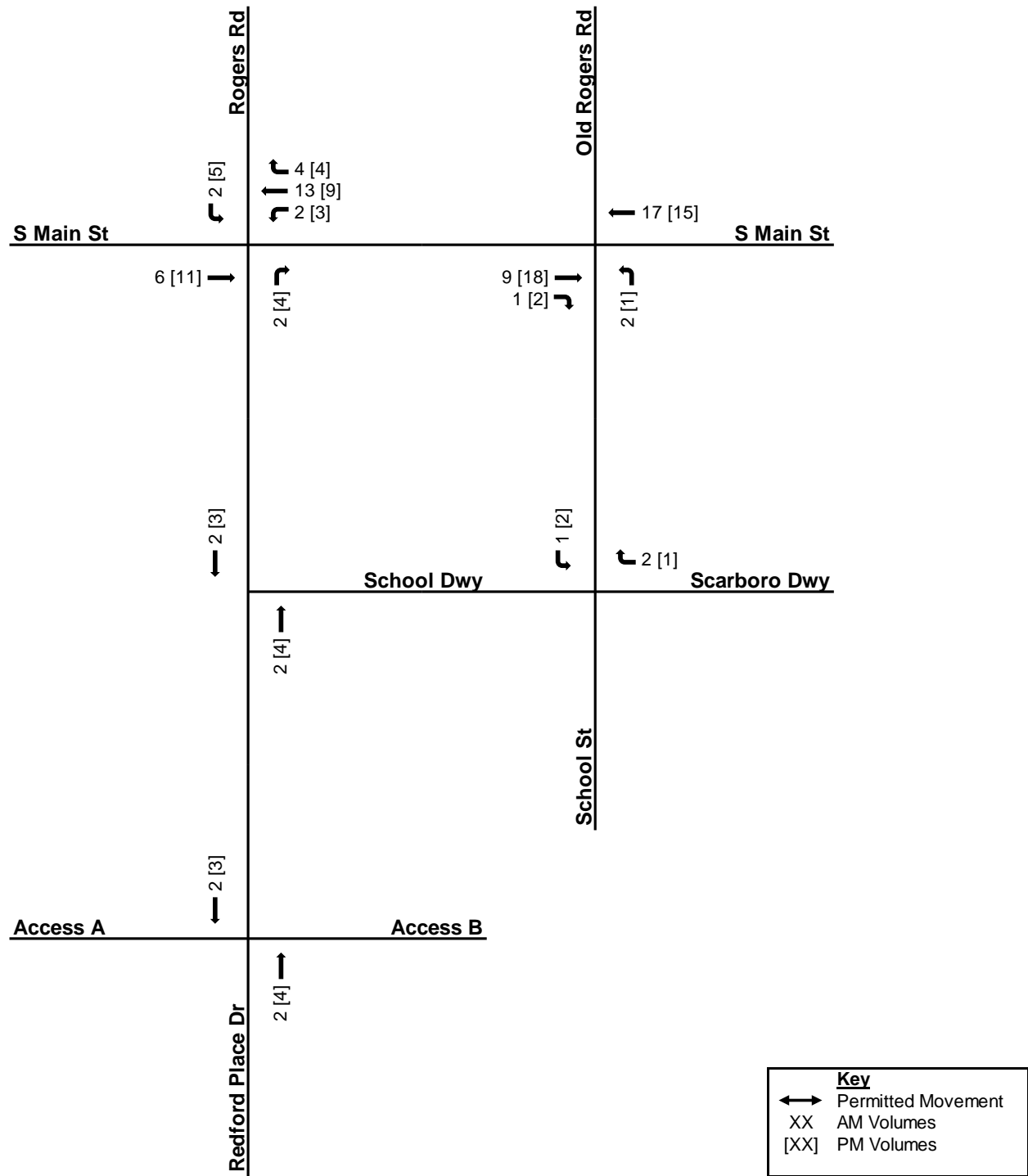


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**PARKER RIDGE TRAFFIC IMPACT ANALYSIS**

Traffic Volumes  
August 15, 2022

**Figure 11: 2028 No-Build Traffic Volumes**

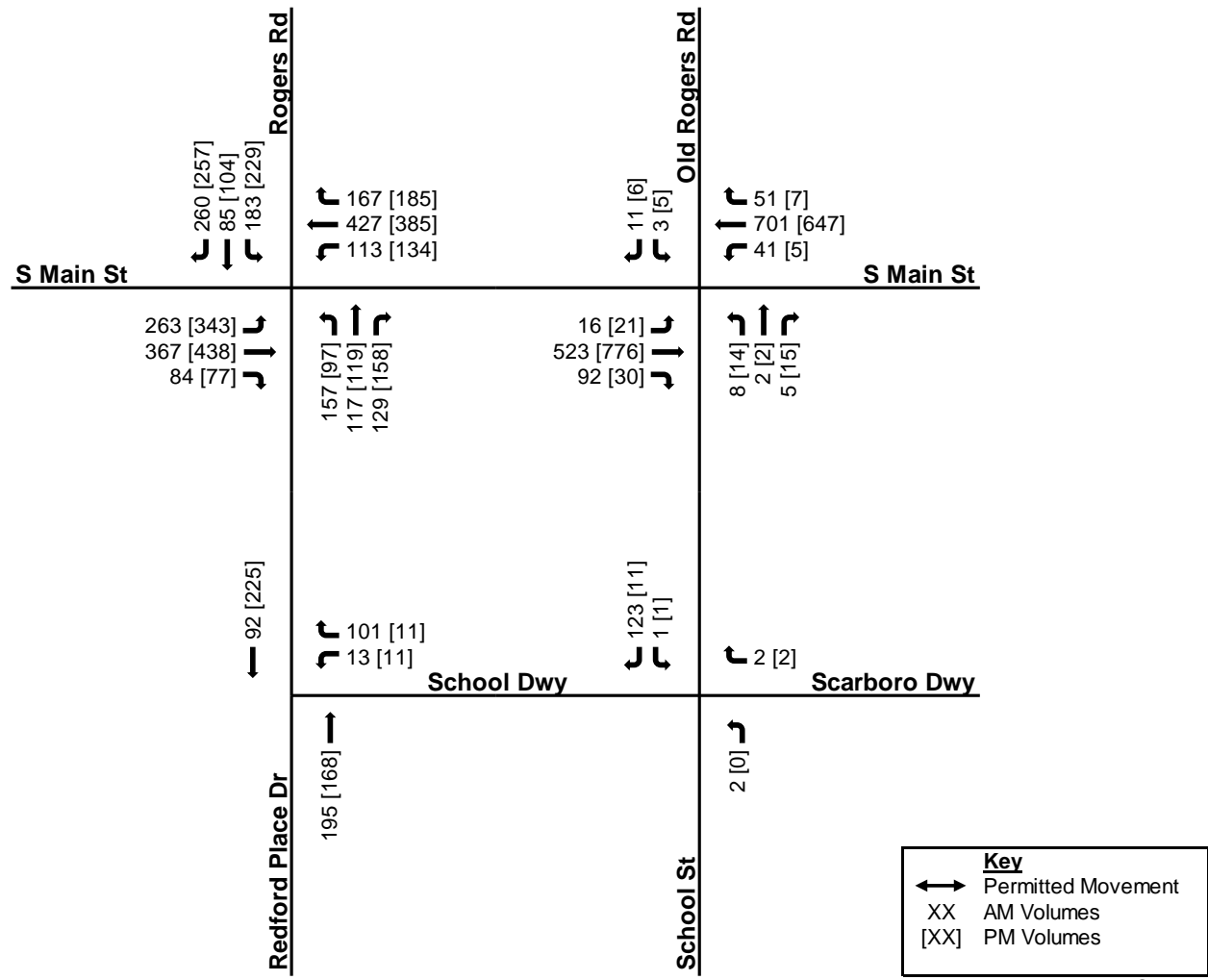


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**PARKER RIDGE TRAFFIC IMPACT ANALYSIS**

Traffic Volumes  
August 15, 2022

**Figure 12: 2028 Build Traffic Volumes**

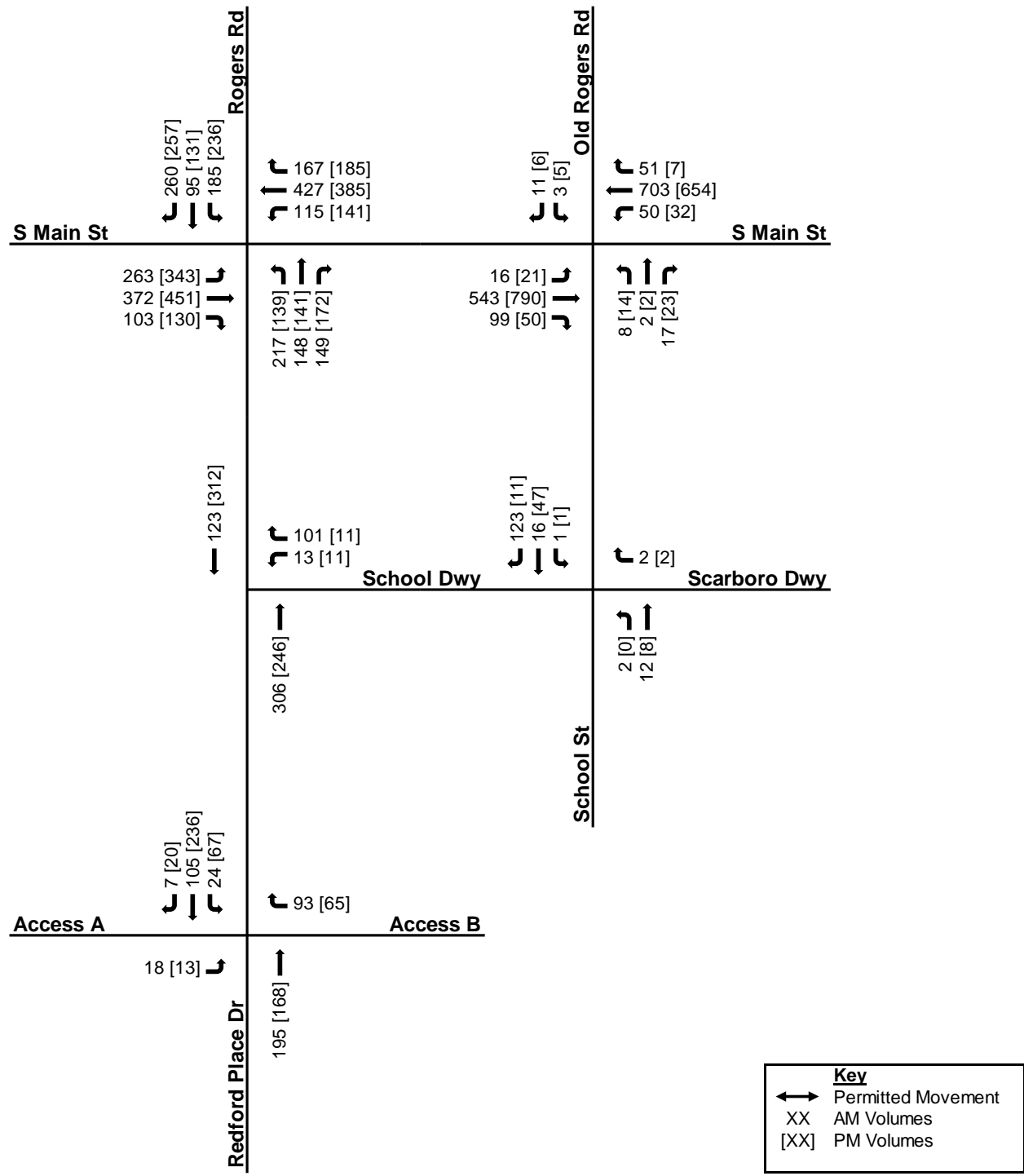


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## 5.0 TRAFFIC ANALYSIS

Capacity analyses were performed for the roadway network in the study area. The traffic analysis program Synchro Version 10 and SIDRA Intersection 9 was used to analyze all signalized and stop-controlled intersections according to methods put forth by the Transportation Research Board's Highway Capacity Manual<sup>4</sup> (HCM). The HCM defines capacity as the "maximum rate or flow at which persons or vehicles can be reasonably expected to traverse a point or uniform section of a line or roadway during a specified period under prevailing roadway, traffic, and control conditions, usually expressed as vehicles per lane per hour."

Level of service (LOS) is a term used to describe different traffic conditions and is defined as a "qualitative measure describing operational conditions within a traffic stream, and their perception by motorists or passengers." LOS varies from Level A, representing free flow, to Level F where traffic breakdown conditions are evident. At an unsignalized intersection, the primary traffic on the main roadway is virtually uninterrupted. Therefore, the overall delay for the intersection is usually less than what is calculated for the minor street movements. The overall intersection delay and the delay for the intersections' minor movement(s) are reported in the summary tables of this report. LOS D is acceptable for signalized intersections in suburban areas during peak periods. For unsignalized intersections, it is common for some of the minor street movements or approaches to be operating at LOS F during peak hour conditions and that is not necessarily indicative of an area that requires improvements.

Capacity analyses were completed following *NCDOT Capacity Analysis Guidelines*<sup>5</sup> as well as the *Draft NCDOT Capacity Analysis Guidelines Best Practices*<sup>6</sup>. Table 3 presents the criteria of each LOS as indicated in the HCM.

**Table 3: Level of Service Criteria**

Level of Service (LOS)	Signalized Intersection Control Delay (seconds / vehicle)	Unsignalized Intersection Control Delay (seconds / vehicle)
A	≤ 10	≤ 10
B	>10 and ≤ 20	>10 and ≤ 15
C	>20 and ≤ 35	>15 and ≤ 25
D	>35 and ≤ 55	>25 and ≤ 35
E	>55 and ≤ 80	>35 and ≤ 50
F	>80	>50

The Town of Rolesville's Land Development Ordinance<sup>7</sup>, section 8.E, establishes the following Level of Service Standards:

1. *The traffic impact analysis must demonstrate that the proposed development would not cause build-out-year, peak-hour levels of service on any arterial or collector road or intersection within the study area to fall below Level of Service (LOS) "D," as defined by the latest edition of the Highway Capacity Manual, or, where the existing level of service is already LOS "E" that the proposed development would not cause the LOS to fall to the next lower letter grade.*



## PARKER RIDGE TRAFFIC IMPACT ANALYSIS

Traffic Analysis  
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2. *If the road segment or intersection is already LOS "F," the traffic impact analysis must demonstrate that the proposed development, with any proposed improvements, would not cause build-out year peak-hour operation to degrade more than five (5) percent of the total delay on any intersection approach.*

Capacity analyses were performed for the following conditions:

- 2022 Existing;
- 2028 No-Build;
- 2028 Build; and
- 2028 Build with Improvements.

Peak hour factors for all analysis scenarios were set to 0.9 with one exception. That is, all movements into and out of Rolesville Elementary School utilize a peak hour factor of 0.5 per NCDOT Municipal School Transportation Assistance.

All Synchro and SIDRA files and detailed printouts can be found in the appendix. A summary of the results of the analyses is provided in the following sub-sections.






## PARKER RIDGE TRAFFIC IMPACT ANALYSIS

Traffic Analysis  
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### 5.1 2022 EXISTING

In the base year of 2022 under the existing geometric conditions, all study intersections and approaches operate at an acceptable LOS. Synchro LOS and delay results for the 2022 Existing analysis scenario are listed in Table 4.

**Table 4: 2022 Existing Level of Service and Delay**

Intersection		Approach	Lane Group	Delay (sec. / veh.)		Level of Service (LOS)		95th % Queue (feet)		Max. Obs. Queue (feet)	
				AM	PM	AM	PM	AM	PM	AM	PM
	Old Rogers Road / School Street at South Main Street (US 401 Business)	EB	L	8.8	8.6	A	A	0	3	18	19
		WB	L	8.5	9.0	A	A	3	0	32	26
		NB	LTR	22.5	27.8	C	D	5	15	30	43
		SB	LTR	21.1	28.7	C	D	8	8	43	33
	Redford Place Drive / Rogers Road at South Main Street (US 401 Business)	Overall		35.2	36.2	D	D				
		EB	L	21.0	28.4	C	C	188	291	180	280
			TR	18.4	24.7	B	C	262	392	206	309
		WB	L	25.7	30.8	C	C	71	119	116	177
			T	29.2	31.3	C	C	350	341	288	289
			R	8.7	8.6	A	A	55	59	112	101
		NB	L	52.9	47.3	D	D	152	93	185	128
			T	70.5	70.9	E	E	133	137	169	184
			R	42.1	41.6	D	D	108	131	170	200
		SB	L	75.8	71.5	E	E	170	207	185	221
			T	66.0	59.4	E	E	90	127	101	197
R	42.4		35.5	D	D	224	212	255	282		
	Redford Place Drive at School Driveway	WB	LR	10.5	9.7	B	A	23	3	81	29



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### 5.2 2028 NO-BUILD

In the 2028 No-Build conditions, the analysis assumes the improvements associated with the approved developments and NCDOT projects are constructed. These improvements were discussed in Sections 2.4 and 4.2, but are also listed below:

#### South Main Street at Redford Place Drive/Rogers Road

- Remove existing westbound dedicated right-turn lane.
- Reduce the storage of the northbound left-turn lane from 200 feet to 175 feet of full-width storage.

#### School Street at School Driveway/Scarboro Driveway.

- Construct a stop-controlled westbound approach at the intersection for access to the Scarboro Property development.

In the future year 2028, the following intersections and movements operate at a LOS E or F:

The Main Street & Redford Place Drive/Rogers Road intersection operates at LOS E in the PM peak hours. The minor northbound and southbound approaches at the Main Street & Old Rogers Road/School Street intersection operate at LOS F in the AM peak hour and LOS E in the PM peak hour.

The northbound through and southbound left movements at the Main Street & Redford Place Drive/Rogers Road intersection operate at LOS F in both peak hours and the eastbound left movement operates at LOS F in the PM peak hour.





Synchro LOS and delay results for the 2028 No-Build analysis scenario are listed in Table 5.



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**Table 5: 2028 No-Build Level of Service and Delay**

Intersection		Approach	Lane Group	Delay (sec. / veh.)		Level of Service (LOS)		95th % Queue (feet)		Max. Obs. Queue (feet)	
				AM	PM	AM	PM	AM	PM	AM	PM
	Old Rogers Road / School Street at South Main Street (US 401 Business)	EB	L	9.6	9.2	A	A	3	3	32	33
		WB	L	9.4	9.8	A	A	5	0	45	24
		NB	LTR	70.7	47.7	F	E	23	30	40	60
		SB	LTR	51.5	41.9	F	E	20	13	38	42
	Redford Place Drive / Rogers Road at South Main Street (US 401 Business)	Overall		51.8	58.5	D	E				
		EB	L	72.0	80.1	E	F	385	498	298	300
			TR	24.9	29.3	C	C	393	477	506	837
		WB	L	61.6	61.4	E	E	157	179	275	275
			TR	45.4	59.3	D	E	637	690	672	745
		NB	L	69.7	60.2	E	E	247	142	245	198
			T	96.8	119.6	F	F	226	229	231	266
			R	40.9	41.5	D	D	154	182	189	243
		SB	L	80.0	96.0	F	F	290	363	258	298
			T	69.2	62.6	E	E	138	149	244	518
R	39.8		31.9	D	C	284	251	287	267		
	School Street at School Driveway / Scarboro Driveway	WB	LTR	8.9	8.6	A	A	3	3	30	29
		NB	LTR	7.8	7.3	A	A	0	0	0	0
		SB	LT	7.2	7.2	A	A	0	0	0	0
	Redford Place Drive at School Driveway	WB	LR	11.2	10.3	B	B	30	5	80	50



## PARKER RIDGE TRAFFIC IMPACT ANALYSIS

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### 5.3 2028 BUILD

This analysis scenario evaluates traffic operations under the increased traffic demands associated with the proposed Parker Ridge development. Similar to the 2028 No-Build scenario, the Main Street & Redford Place Drive/Rogers Road intersection operates at LOS E in the PM peak hour. The northbound through movement operates at LOS F in both peak hours, the northbound left movement operates at LOS F in the AM peak hour, and the eastbound left and southbound left movements operate at LOS F in the PM peak hour.

The westbound queue along Main Street from the Redford Place Drive/Rogers Road intersection extends into the Main Street & Old Rogers Road/School Street intersection during the PM peak hour, preventing lefts and throughs from being made from the northbound School Street and southbound Old Rogers Road intersection. As a result, delays from these approaches exceed 400 seconds in the PM peak hour.

The roundabout at the Redford Place Drive & Access A/Access B intersection operates at LOS A in both peak hours.

Capacity analysis results for the 2028 Build analysis scenario are listed in Table 6.










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**Table 6: 2028 Build Level of Service and Delay**

Intersection		Approach	Lane Group	Delay (sec. / veh.)		Level of Service (LOS)		95th % Queue (feet)		Max. Obs. Queue (feet)	
				AM	PM	AM	PM	AM	PM	AM	PM
	Old Rogers Road / School Street at South Main Street (US 401 Business)	EB	L	9.6	9.3	A	A	3	3	27	71
		WB	L	9.6	11.3	A	B	5	5	48	127
		NB	LTR	58.8	580.5	F	F	33	133	47	182
		SB	LTR	63.5	410	F	F	23	58	47	100
	Redford Place Drive / Rogers Road at South Main Street (US 401 Business)	Overall		55.0	62.7	D	E				
		EB	L	79.8	86.9	E	F	385	498	300	300
			TR	28.4	32.4	C	C	428	553	544	1000*
		WB	L	61.9	77.0	E	E	160	225	275	275
			TR	52.0	65.3	D	E	705	714	782	1262*
		NB	L	82.9	68.9	F	E	339	219	268	264
			T	86.2	105.9	F	F	254	254	368	344
			R	28.3	43.5	C	D	124	202	186	248
		SB	L	78.3	103.8	E	F	285	378	259	298
			T	69.3	65.9	E	E	151	180	250	512
R	34.4		31.3	C	C	196	248	244	252		
	School Street at School Driveway / Scarboro Driveway	WB	LTR	9.0	8.8	A	A	3	3	34	27
		NB	LTR	7.8	7.4	A	A	0	0	0	0
		SB	LT	7.3	7.2	A	A	0	0	0	0
	Redford Place Drive at School Driveway	WB	LR	12.8	11.1	B	B	35	5	86	39
	Redford Place Drive at Access A / Access B	Overall		4.1	4.4	A	A				
		EB	LTR	3.6	4.2	A	A	3	3	27	26
		WB	LTR	4.7	4.3	A	A	16	11	40	38
		NB	LTR	4.3	4.5	A	A	26	24	34	48
		SB	LTR	3.4	4.3	A	A	15	39	17	61

\* Queue Extends Off SimTraffic Network or Into Next Intersection



## PARKER RIDGE TRAFFIC IMPACT ANALYSIS

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### 5.4 2028 BUILD IMPROVED

#### 5.4.1 South Main Street at Old Rogers Road / School Street

With the addition of traffic generated by the proposed development, the northbound approach of School Street at South Main Street increases in delay such that LOS degrades from E to F. It is not uncommon for unsignalized side-street approaches to operate with high delays during peak periods. As traffic on Main Street does not stop, the overall delay at the intersection is relatively low at 2.3 seconds per vehicle in the AM peak hour and 18.9 seconds in the PM peak hour. If high delays are experienced on the stop-controlled approaches, drivers may opt for alternative routes. Even so, the intersection was evaluated for potential improvements due to meet the requirements of the LDO<sup>7</sup>. What follows is a discussion of each possible improvement at the intersection:

##### 5.4.1.1 Installation of a Traffic Signal

The installation of a traffic signal would improve the LOS of the side streets significantly. This, however, is not anticipated to be permitted by NCDOT due to the following:

- The proximity of the intersection to the adjacent signalized intersection of South Main Street at Redford Place Drive / Rogers Road
- Traffic volumes on the side-street approaches of Old Rogers Road and School Street are low and are not anticipated to meet the warrants for installation of a traffic signal included in the Manual on Uniform Traffic Control Devices (MUTCD)<sup>8</sup>.

##### 5.4.1.2 Installation of Turn Lanes

The construction of dedicated left-turn turn-lanes on Old Rogers Road and School Street reduces delay but does not mitigate the impact of the proposed development. This is attributed to low volumes of traffic on the side-street approaches and high through volumes on South Main Street. The installation of turn lanes may also impact adjacent property owners. As a result, the installation of turn lanes on Old Rogers Road and School Street is not recommended.

##### 5.4.1.3 Restriction of Access

Converting the southbound approach of Old Rogers Road to right-in / right-out access by installing channelization was shown to reduce delays on the side streets such that School Street is anticipated to operate at LOS C and Old Rogers Road is anticipated to operate at LOS B during the PM peak hour.

This would require left turns from Old Rogers Road to be redirected to Rogers Road and use the traffic signal at the intersection of South Main Street at Redford Place Drive / Rogers Road; increasing travel time for existing vehicles on the Old Rogers Road approach. Furthermore, the restriction of access without the installation of a median has only limited effectiveness. As a result, the restriction of access is not recommended.

Therefore, no improvements are recommended at this intersection in conjunction with this development. Consideration should be made for limiting the southbound Old Rogers Road approach to right-in / right-out-only access in the future.



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### 5.4.2 South Main Street at Redford Place Drive / Rogers Road

The signalized intersection of South Main Street at Redford Place Drive / Rogers Road operates at LOS E during the PM peak hour in both the no-build and build scenarios. In this instance, the LDO requires mitigation if the proposed development causes the LOS to fall to the next lower letter grade. As the intersection operates at LOS E during both the no-build and build scenarios, no improvements are recommended at this intersection.



## PARKER RIDGE TRAFFIC IMPACT ANALYSIS

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### 6.0 RECOMMENDATIONS

The following improvements are recommended as part of the Parker Ridge development.

#### Old Rogers Road / School Street at South Main Street

- No improvements are recommended at this intersection

#### Redford Place Drive / Rogers Road at South Main Street

- No improvements are recommended at this intersection

#### School Street at School Driveway / Scarborough Driveway

- No improvements are recommended at this intersection

#### Redford Place Drive at School Driveway

- No improvements are recommended at this intersection

#### Redford Place Drive at Access A / Access B

- Construct Access A and Access B at the existing roundabout along Redford Place Drive south of the School Driveway intersection. Both intersections should have a minimum internal protective stem of 100 feet.

The recommended improvements are illustrated in Figure 13.



**PARKER RIDGE TRAFFIC IMPACT ANALYSIS**

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**Figure 13: Recommended Improvements**

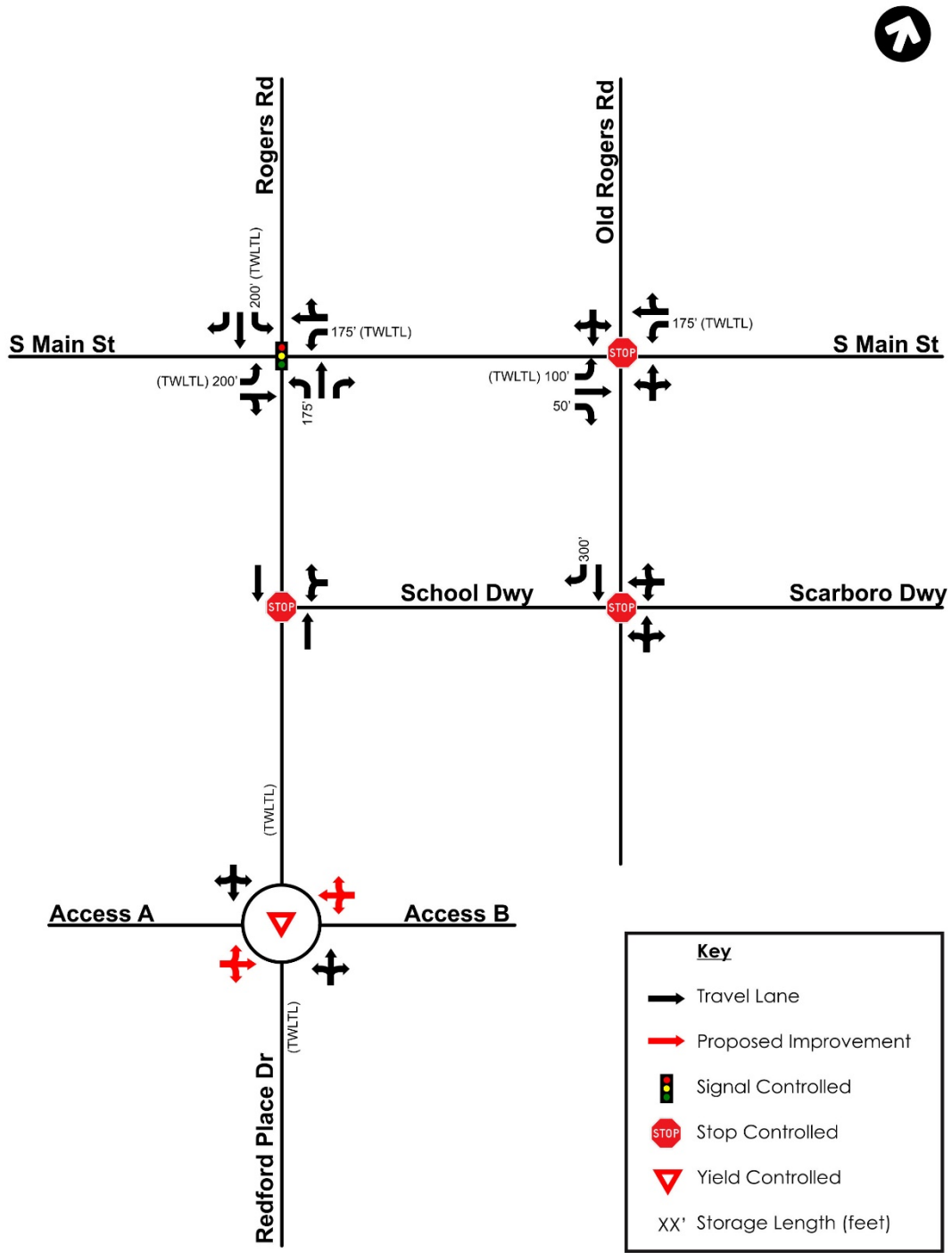


Figure is Not To Scale



## PARKER RIDGE TRAFFIC IMPACT ANALYSIS

References

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### 7.0 REFERENCES

<sup>1</sup> ***NCDOT Functional Classification Map***,

<http://ncdot.maps.arcgis.com/home/webmap/viewer.html?layers=029a9a9fe26e43d687d30cd3c08b1792>

<sup>2</sup> ***2020 NCDOT Average Daily Traffic Volumes***,

<https://ncdot.maps.arcgis.com/apps/webappviewer/index.html?id=964881960f0549de8c3583bf46ef5ed4>

<sup>3</sup> ***Trip Generation (11<sup>th</sup> Edition)***, Institute of Transportation Engineers (ITE), September 2021.

<sup>4</sup> ***Highway Capacity Manual 6<sup>th</sup> Edition: A Guide for Multimodal Mobility Analysis***. Washington D.C.: Transportation Research Board, 2016.

<sup>5</sup> ***NCDOT Capacity Analysis Guidelines***. North Carolina Department of Transportation (NCDOT), March 2022, <https://connect.ncdot.gov/resources/safety/Congestion%20Mngmt%20and%20Signing/Standards%20-%20Capacity%20Analysis%20Guidelines.pdf>

<sup>6</sup> ***Draft NCDOT Capacity Analysis Guidelines: Best Practices***. North Carolina Department of Transportation (NCDOT), March 2022, <https://connect.ncdot.gov/resources/safety/Congestion%20Mngmt%20and%20Signing/Best%20Practices%20-%20Capacity%20Analysis%20Guidelines.pdf>

<sup>7</sup> ***Land Development Ordinance***. Town of Rolesville, June 1, 2021, <https://www.rolesvillenc.gov/code-ordinances>

<sup>8</sup> ***Manual on Uniform Traffic Control Devices (MUTCD)***. Federal Highway Administration, May 2012, [https://mutcd.fhwa.dot.gov/kno\\_2009r1r2.htm](https://mutcd.fhwa.dot.gov/kno_2009r1r2.htm)

### 8.0 APPENDIX

- Scoping Correspondence
- Site Plan
- Raw Traffic Count Data
- Approved Development Information
- Traffic Volume Calculations
- Synchro Files
- Synchro & SimTraffic Reports
- SIDRA files

